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6. W. H. Klein and J. S. Winston, "Geographical Frequency of Troughs and Ridges on Mean 700-mb. Charts," *Monthly Weather Review*, vol. 86, No. 9, Sept. 1958, pp. 344–358.

7. J. F. O'Connor, "Hemispheric Distribution of 5-Day Mean 700-mb. Circulation Centers," *Monthly Weather Review*, vol. 92, No. 6, June 1964, pp. 303–315.

[*Received July 26, 1965; revised September 8, 1965*]

CORRESPONDENCE

(Continued from page 704)

work was available to me at the time my paper was in manuscript form. The second of his papers has yet to be published as of this writing. After examining Dr. Tucker's first paper, I am still of the opinion that no correlation has been found. The evidence to which Dr. Tucker refers is apparently contained in his figures 11 and 12 and the associated discussion in the text. Despite careful reading of this area of his paper, I am unable to estimate how much $\overline{v'u'}$ or $\partial(\overline{v'u'})/\partial y$ varies with the choice of one of the three pairs of stations which were used to determine averages of the latter quantity. No statistical test of significance, such as standard deviations from the somewhat erratic averages, is presented. Unless similar results are obtained from each of the three pairs, and, preferably, additional pairs of stations at other longitudes, a real correlation of v' and u' cannot be claimed.

Dr. Tucker's second point is that his non-Fickian momentum flux leads to a vertical velocity which is constant with time provided the vertical eddy viscosity is also invariant in time, whereas Reed derives a vertical velocity of 26-mo. period. If I am expected to state my preference between the two results, then I must say that I prefer Reed's since it follows from a simple form for heat diffusion and from observations of wind and temperature which are far more reliably established than Dr. Tucker's estimates of vertical variation of vertical eddy viscosity, or of $\partial(\overline{u'v'})/\partial y$. Moreover, Reed has shown quantitatively that his vertical velocities are consistent with the now well-established oscillation of total ozone amount over the equator.

With respect to Dr. Tucker's third point it may well turn out that QK_{mz} (if such a formulation is applicable at all) varies with height in a way which is related to $\partial(\overline{v'u'})/\partial y$, if and when reliable observations of the latter quantity become available.

[*Received July 21, 1965*]

Further Comments

G. B. TUCKER

Bureau of Meteorology, Melbourne, Australia

When preparing comments on Professor Staley's paper I was aware that my second paper cited was still in the press. However, it was included because it is a sequel to my first paper, is essentially relevant, and will be published before these comments appear. It is perhaps unfortunate that all the points raised in the first paragraph of Professor Staley's reply are dealt with therein.

It was certainly not my intention to ask for an opinion on the relative merits of two different treatments—both of which have appeared in another journal. Professor Staley dealt with a Fickian treatment of momentum which, he argues, appears inapplicable. I agree. But his remarks carried the implication that no non-Fickian treatment existed. I merely sought to draw attention to such a treatment in the literature.

I also agree that it *may* be inapplicable to use the concept of a vertical eddy viscosity. Nevertheless, Professor Staley uses this concept, and, whatever the form of $\partial\overline{v'u'}/\partial y$ turns out to be, there will still remain an important association between the two terms which was not apparent in the paper.

[*Received August 27, 1965*]